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THE COLORADO DESERT

By David P. Barrows

The Colorado River, its cañon valley, and flood-plain constitute a series of physiographic conformations of impressive variety. The upper part of its course has been eroded across the great elevated plain of western America, through which it has cut its channel downward with so great rapidity that its valley walls, almost unaffected in comparison by weathering, rise sheer upward in the gigantic system of gorges known as the Grand Cañon of the Colorado. From the point where it enters California it is no longer a downward eroding stream, but sweeps gradily across the sterile plain of the desert, a dark, sediment-laden current, swinging back and forth across its widening valley. As it nears the Gulf of California and the rapidity of its stream lessens, the enormous loads of fine rock material, cut from the valleys through which it has torn its way, are deposited in a great flood-plain or delta, across which the stream pours south into the gulf.

As above this delta the low banks are unwatered, except at the very margins of the river, the sterility of the surrounding country is unaffected by its immense volume of water.

From whatever direction you approach the river within California or Arizona, the trail lies across sandy hill and thirsty plain, where are the dark marks of old volcanic activity, grotesque rock forms, shaped by wind erosion, and occasional stunted clumps of desert plants, with extremely modified foliage; but nowhere is there suggestion that you are upon the banks of the mightiest river of western America, until suddenly the ground drops slightly, and in an instant there come the dark green coloring of mesquite growth, the bright foliage of cottonwood and willow, the dazzling gleam of wide waters, flowing swiftly, and you are beside the long, shining river of Lopez de Cardenas and Alarcon.

The discovery of the Colorado is one of the romances in the history of the discovery of this continent. In August, 1540, only 48 years after the first voyage of Columbus, the three small ships of Captain Hernando de Alarcon, sent up the Gulf of California to cooperate with the land expedition of Coronado, arrived at the shallow, treacherous head of the great estuary, and, in the language of the chronicle, "it pleased God that after this sort they should come to the very bottom of the bay, where they found a mighty river, which ran with so great a fury of a stream that they could hardly sail against it. So they entered into two boats, which men towed along with ropes from the shore." Up this river, which he named the "Buena Guia," cultivating friendly relations with its numerous Indian peoples, Alarcon went as far, it is believed, as the junction of Williams Fork, 85 leagues, according to the Relacion, "to where the river forms a straight channel between high mountains."

In the same months that Alarcon was dragging his boats up the turgid current, Coronado, now at the Pueblo of Zuñi, heard of the Moki Pueblos of Tusayan. Pedro de Tolar, with 20 men and a priest, made the expedition from Zuñi into that desolate corner of Arizona, where high on their mesas are still standing, as they stood then, the cliff villages of Hualpai and its companions. From these Indians Tolar heard of a great river flowing across the western desert, and returning with this information to Coronado, the chief dispatched Garcia Lopez de Cardenas to search for it. His little band, returning to the Moki villages, struck boldly out across the desolate plain of the "Painted Desert," and after days of travel stood on the brink of that chasm of chasms, the Grand Cañon of the Colorado. They gazed northward across the apparently unending buttes and gorges of the wonderful system, but were unable to reach the great river that looked like a slender rivulet far beneath them. "Its banks were so high," says the Relacion, "that they seemed to be raised three or four leagues into the air. The country is covered with little, stunted fir-trees, is exposed to the north, and is so cold that, although it was summer, we could hardly bear it."

Thus from sea and by land in the same year did the men of Spain discover the noble river of the Colorado at its most stupendous approaches. Almost at the same time a third little band, under Melchor Diaz, starting from the settlement of San Hieronymo, on the Rio Sonora, traversed Arizona from east to west and reached the banks of the Colorado which Alarcon had recently troddden. "In the

course of less than six months," says Bandelier, "the Spanish reconnoitering corps had thus three times touched the largest river of western America, had explored its shores with tolerable accuracy for a considerable length of its course, and had also traveled in two directions through parts of Arizona which have only in very recent time again attracted attention."

The arid region of North America covers a large area. Throughout there is presented that strange uniformity of physical features and life-forms that characterizes deserts the world over. The southern portion of the Colorado Desert possesses, however, bizarre and eccentric features of its own. Its area is commonly understood to comprise the great depressed valley lying half in southern California and half in Lower California, inclosed on the west by the southward extensions of the San Jacinto Mountains, on the north by the desert range of the San Bernardino and Chocolate Mountains in California, and on the south by the course of the Colorado River from Arizona to the gulf.

In very recent geological times this region was an arm of the sea and the Colorado River reached the Pacific Ocean at Yuma. The geological changes that won this valley from the gulf seem to have been two: the upbuilding of an enormous delta from the deposits of the Colorado, and the crustal elevation of the earth beneath the central region covered by this delta to a height sufficient to divide the depression and to retire the gulf to its present shores far south of the line, while it left the upper part still below the level of the sea.* These movements turned the Colorado River into the region still depressed and transformed it into a splendid fresh-water lake. The evidence of the extent of this body of fresh water is most interesting. Its old floor remains, a deep accumulation of fine, fertile soil, rich as the delta of Egypt, which in places is whitened by myriads of fresh-water shells, several small univalves, and a single bivalve, varieties of *anodonta* and *unodesma* still to be found alive in the Colorado itself. For miles along the mountain bases at the northern end, where the still waters of the lake once reached, there runs a broad, white band of calcareous deposit from the tiny mollusca that at one time inhabited its shores. Gradually, however, the river which fed this lake by its constant deposits built up an elevated flood-plain about its mouth that diverted its waters more and more away from the lake until the main channel, impounded in levees of its own making, carried the current

* Barron, the lowest point in the desert, is given as 265 feet below sea level, while Yuma is 175 feet above.

southward once more to the sea. The lake, fed irregularly and poorly, gradually dwindled as the silted banks of the Colorado became more secure, until it is represented today only by the Salton morass and other lagoons and the summer overflow streams by which these are supplied.

All this took place in very recent time. The Cocopah Indians, who today inhabit the upper end of the valley, have a distinct and credible tradition of the drying-up of this lake and of the occasional sudden return of its waters; and the Diegueños, who lived at a time when the supply of water along the central portion of the valley was probably much greater than at present, raised on the naturally irrigated soil abundant crops of maize, melons, and beans. But slowly the valley was abandoned to aridity. Almost unvisited by rainfall except about the edge of the mountains, the loss of the river left it crudely dry. Low and inclosed between heat reflecting ranges that shut off the breezes of the ocean, it gained a temperature which is one of the highest on the globe. The wind storms that rage up the valley from the southeast have drifted great dunes of sand over certain portions, and much of the country never reached by the deposits of the lake is as black, stony, and repulsive as eruptive rock formations in the desert can be. Apparently about the middle of the first half of the century the overflow from the Colorado was largely checked and not restored to any extent until the year 1849. The Indians, who had lived in plenty along the central valley, were driven by the drought forever from their homes.

In November, 1847, the advance column of American troops, under Kearny, moving across from Fort Leavenworth for the conquest of California, crossed the desert from Yuma to San Diego. The troops suffered severely from thirst, finding no water, except a scant supply at Alamo Mocho, the first station after leaving the Colorado. In the middle of the plain they found a salt pool, approached through a thick, soapy quagmire, but the water was unfit for man or beast. This lake indicates at least a slight overflow at that time, and Major Emory reported that captured Spaniards who guided them told of a stream of running water some miles south of Alamo. This stream the Americans were unable to find (no overflow taking place so late in the fall), and their experience led them to announce the desert as almost wholly without water supply.*

But in 1849 came the rush of emigrant parties from the southern

* See the report of Major Emory, "Notes of a Military Reconnoissance," 30th Washington, 1848, pp. 100-108.

states through Texas and New Mexico along the Gila River trail into southern California, and these parties, pushing from the Colorado across the awful desert that separated them from the fertile lands of the coast, when midway on their course unexpectedly found themselves on the banks of a strong, turgid stream, which was not flowing toward the sea, but sweeping strangely northward into the interior. It was the sudden and dramatic resumption of the old Colorado inundations. They called it the "New River." Lieutenant Wilkinson, writing soon afterward in the Pacific Railroad Reports, says of this phenomenon of 1849:

"In that year the Colorado River was very high, and broke over a part of its banks between the mouth of the Gila and the head of the gulf. The waters spread inland, running backward through the desert toward the center of the ancient lake. . . . The appearance of the stream was a subject of general surprise and wonder, and was an unexpected relief to the many emigrant parties crossing the desert that year. It is the general belief that this overflow was the first recent instance of the kind, but it had evidently often taken place long before, and there are many reasons for believing that it once flowed in a larger and stronger stream than it has since its existence became known." *

Since 1849 the overflow of the Colorado River has been frequent, and since 1890 uninterrupted every summer. By most dwellers in southern California this overflow is well understood, but very few are aware of the circuitous and remarkable route by which the water of the Colorado, through New River, reaches Salton Sea. High water in the Colorado comes in the months of May and June, and the break in the upbank banks of the river occurs 10 or 12 miles below the Mexican boundary line, near Algodones, an old Yuma Indian village, where now is a Mexican hamlet and a station for several customs officers. From near the point where the break occurs a comparatively small current, the East or Alamo River, cuts its channel westward for about 30 miles, and then turns northwesterly into the United States, and on its way to the Salton Sea fills a large depression known as Mesquite Lake. The greater part of the overflow, however, takes another direction, and sweeps southwesterly almost entirely across the lower part of the desert until it meets the slope of the Cocopah Mountains. Here it creates a long, shallow body of water, called Volcano Lake.

This point is the divide, where the desert slopes northward into the United States and southward to the gulf, and from this lake the

* Pacific Railroad Reports, vol. 2; "Geological Sketch," by Wm. P. Blake, Washington, 1856.

waters break away in both directions. The main current flows southward, and is called Hardy's Colorado, or the Hardy River. But when the overflow is at its height and the region about the lake has become a vast area of inundation, a splendid stream bursts away down the northern slope backward into the interior. This is the New River. Its main channel is accompanied by many sloughs, and wide areas for miles on each side of the current are submerged. Shortly after crossing the boundary line, the New River flows through a de-

[illegible] SEEN BEYOND ALONG BANKS OF THE HARDY [illegible] MOUNTAINS IN BACKGROUND

From a photograph by the author.

pression about half a mile long and 20 feet deep, known as Cameron Lake, and from here along its winding course northward are many lagoons and water-holes, for the most part pools of a few acres of extent, lying off the main channel and connected with the New River by short sloughs. They are surrounded by a growth of mosquito, and water in all of them lasts for many months after the New River overflow has ceased. Cameron Lake is one of the largest and deepest, and its waters have usually "held over" from one overflow to the next; the small, dirty, and reeking pool into which it subsides late in

the spring being the main reliance of desert travelers. The river, however, passes directly through the lake, and the lands of sediment which it deposits at every checking of its course are gradually filling up Cameron Lake and making it less reliable.

But even after the great summer inundation of the desert has subsided and Volcano Lake has become exhausted, the Hardy continues to be fed from the break in the Colorado through the Rio Padrones, and throughout the year its channel contains water. In summer and until late in the fall its current is from 100 to 200 yards wide and 20 to 25 feet deep, with a flow of at least two miles an hour in the center of the stream. Below the Sierra Madre it turns eastward, and joins the main channel of the Colorado again just above the gulf. At times of very high water a curious result occurs. Westward of the Cocopah Mountains lies a great depressed plain, lower than the Cocopah Valley, lower than the sea, the desert of the Laguna Maquata or Salada. Like the Colorado it was lately an arm of the ocean. At the southern end of the Cocopah Mountains the Hardy sometimes overflows and sends a current around the foot of the range and northward into this low region, creating the Laguna Maquata. This desert of the Laguna Maquata is a desperately arid and forsaken country, almost without water, except during these occasional baskets of the Hardy.

The main lines of travel—the old San Diego road through Jacumba Pass and the Warner's Ranch stage road by way of San Felipe and Carriso Creek—meet on their way to Yuma at Laguna Station, pass by Indian Wells and Cameron Lake, and a few miles further on turn southward into Mexico and follow the Alamo wash to the Colorado River and Yuma. Scores of traveling teams continue to cross the desert each year along these old emigrant and government roads. The lower portion of the Colorado Desert, however, which lies in the Mexican Territory of Lower California and which extends from the boundary line to the gulf, is far less known and is, in fact, visited by few Americans or Mexicans. It is known as the Hardy River country or the Cocopah country, from the Indians whose rancherias lie along the Hardy Valley and the Lower Colorado.

We visited this interesting country in August, 1888. The overflow had been of unusual amount and of more than ordinary duration. New River was still a swift, roily stream that defied crossing with wagons. All night in order to avoid the heat of the day, we had been pushing our mule teams across the sandy plains and rough mesas that make up those portions of the desert between the Sierra and the rich, level, fluviatile deposits of the central depression.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

As the way bends westward toward Signal Mountain, the northern peak of the Cocopah range, disappears from view, but in front, peaks, rig- [illegible] of the Sierra Prieta, called by Americans "Black Butte." Such active eruptions of lava as built up this perfect crater are no longer past and secondary volcanic activity is at the present [illegible] to be but [illegible] [illegible] springs or mud volcanoes [illegible]. These are found in two places on the Colorado Desert—in the Coyote Valley a few miles from Sierra Prieta, and farther north, just south of Salton Sea.

The [illegible] of the Sierra Prieta [illegible] of evidence of recent action. North of the mountain and half a mile from its base are three holes, the largest 100 yards long and 50 feet [illegible], which were [illegible] the rock [illegible] perfectly [illegible] of vesicular [illegible] would be formed by the [illegible] gas [illegible] molten [illegible]. The Sierra itself is several hundred feet high, and with the deposits of broken lava [illegible] around its base has a circumference of seven or eight miles. The rock is [illegible] lava, with [illegible] The rock of the sides is much broken by weathering, but the edge of the crater is [illegible]. The floor of the depression is smooth [illegible] covered with fine clay, evidently blown in by winds. Water at times has stood at [illegible] depth in the crater. It is 250 paces across the perfectly [illegible] bottom. At the center of the floor a small basin has been scooped out by [illegible] the last drops of [illegible] water.

The mud volcanoes [illegible] south of the Sierra Prieta, and during the overflow are [illegible] by the waters of the New and Hardy Rivers [illegible] a few of these [illegible] are [illegible] the [illegible] waters of Volcano Lake. At the time of my visit one of these [illegible] beneath the water [illegible] never [illegible] above the surface [illegible] that could be heard at a distance of [illegible] four miles. Among the stones

of the lake spurted jets of boiling steam, and little streams of hot water escaped from the fissures. They smelled of sulphur and were very warm. At the edge of the water were four or five mud craters, 8 to 12 feet in diameter, filled with hot water, in which was a constant ebullition and escaping of gas. The bank was covered with black, earthy deposits, and a carbonized grass grew at the edge of the water. The mud ground was everywhere hot and the tiny rivulets scalding. The retiring of the shores of the lake after the overflow has ceased leaves most of the ground dry during the greater part of the year. A small pool is left, however, whose waters assume a deep wine color, [illegible] on the red ground. It is called the Laguna Prieta, or Ink Lake. At [illegible] twenty feet across, had left it full of a beautiful deposit of sodium chloride, gleaming white and apparently pure.

The real center of activity is a cluster of mud volcanoes of the [illegible] places of rising gas, a small amphitheater on the west, and low [illegible] of soft crust [illegible] between it and the lake. The whole [illegible] is [illegible] and dotted with these [illegible] cones. Some [illegible] of gas in [illegible]. I counted some 70 in the place. Many were quiescent, silent or nearly so. About 15 were very [illegible] of 10 feet. On one side there was the roar of escaping gas, the explosion and a rush of [illegible]. Except for the persistent [illegible] of boiling [illegible]. The [illegible] on [illegible] bare feet across the place [illegible] with the [illegible] of a Robinson Crusoe [illegible] was a deep pool of warm water on the edge [illegible] a mud [illegible] and a pebble larger than [illegible] the [illegible]. It [illegible] proved only [illegible]. Near by was another pool, hot, salty, and [illegible] to the taste.

For at least 50 years and we know not how much longer before [illegible] and the heat that lies beneath the [illegible] will

[illegible]

[illegible]

[illegible]

as they do to-day.

The great moral work of the cowboy now attracted to some of our full by American and foreign [illegible] Thousands of head of stock [illegible] the [illegible] Below the line of [illegible] I saw a [illegible] herd of [illegible] the property of [illegible] which I had [illegible] for several years.

The cows of cattle on the desert gave [illegible] [illegible] of [illegible] have no [illegible] [illegible] the desert of [illegible] trade and [illegible] [illegible] water [illegible] water and spring [illegible] before the [illegible] settle now so very [illegible] the stage coach or great road — or by the pioneers wagon, then comes the [illegible] [illegible] of [illegible] to [illegible] of desert clay because [illegible] the [illegible] of the earth. The cattle [illegible] [illegible] are [illegible] to [illegible] [illegible] out of the [illegible] [illegible] [illegible] water. [illegible] "bogging down" [illegible] [illegible] source in the [illegible] clay of [illegible] [illegible] [illegible] the new [illegible]

[illegible] of coffee, baking powder bread and [illegible] beef roasted on the [illegible] cover of a [illegible] of corn [illegible] as a protection against [illegible]

the restless herds of [illegible]

THE CHINESE PARADOX

By Harvey Maitland Watts

[illegible]

[illegible] their former position [illegible]

[illegible] assume the attitude of a superior state dealing contemptuously and condescendingly with its feudatories. This anomaly, which the Powers would better never have endured, [illegible] the exercise of diplomatic functions that normally subsist between great nations [illegible] the position of [illegible] which [illegible] was a vassal more or less dependent, and any insolence on the part of China [illegible] always possible for, arrogant and ignorant as was the Manchu court, it would never have dared to attempt to [illegible] the statesmen and [illegible] that the Powers, which for 40 years had allowed their envoys to be treated [illegible] beneath the dignity of the states they represented, would not interfere were a [illegible] foreign Government carried to an [illegible] extreme of arrogance.

However small Chinese sovereignty was made at the treaty ports, at the capital it not only saved "its face," but by forcing Europe and America meekly to accept, [illegible] to the world,—the supremacy of the puppet "Son of Heaven," [illegible] prestige [illegible], to which were [illegible] possibilities of evil. Advantage was taken of the complaisance of the Powers as to what they considered were [illegible], which to the [illegible] were [illegible] national rights. The envoy who left his home [illegible] conscious [illegible] that in him was personified the greatness of the country he represented and that he was the representative of a mighty civilization, was surprised to find that, though he was surrounded by the [illegible] and [illegible] comforts of twentieth century [illegible], by the [illegible] tyranny of [illegible] etiquette he was classed as an inferior person and was obliged to carry [illegible] with [illegible] his usefulness and paralyze his influence. [illegible] "face" [illegible] that [illegible] were [illegible].

That the present [illegible] none of [illegible] indifferent [illegible]. After [illegible]. As the feeling of contempt which [illegible] position [illegible] by the [illegible] grew, the [illegible] became bolder and when they were successful, with [illegible] and [illegible] western [illegible].

movement against the foreigners. That the movement grew to that and on the scale that its significance is not overestimated is shown by the astonishing fact, revealed in the latest British Blue Book on the Chinese difficulty, that on June 6 last, when the envoys finally renewed the [illegible] [illegible] confronted them since the Tsung-li-[illegible] by a futile discussion as to whether they had a right, not as ambassadors, to demand audience with the government itself. The question was not a pressing one. They were the envoys of the greatest nations of the globe. Since January the anti-foreign movement had been gaining ground, connived at by the highest officials in province and capital, and secretly supported by the government itself. The complicity of the government was evident in March. Every member of the diplomatic corps knew he was dealing with a [illegible] government in which duplicity was [illegible] [illegible] which was only made to [illegible] the [illegible] and [illegible] [illegible] was each time by the rest [illegible] of [illegible] [illegible] on that [illegible] of court punctilio or etiquette? [illegible] [illegible], were the [illegible] in the face of March [illegible] evidence that all that Sir Claude MacDonald [illegible] [illegible] [illegible] suggest on June [illegible] Lord Salisbury was [illegible]:

> There is a considerable [illegible] the part of the diplomatic corps to request an [illegible] in order to represent the seriousness of the situation to the [illegible], but as yet I am not aware whether [illegible] [illegible] the approval of Her Majesty's government.

A day later the Empress and Tuan [illegible] decided to [illegible] the legationers [illegible] and the women and children were harbored in the British legation compound, and within a week [illegible] depended upon Seymour's failure to get through, [illegible] [illegible] and [illegible]. The envoys, in fact, could hardly have been more helpless [illegible] have been "the [illegible] bearers from a vassal state," as Chinese [illegible] [illegible] [illegible] them. [illegible] [illegible] [illegible], was an echo of the past, and the Chinese government [illegible] equally [illegible]. We now see that [illegible] [illegible] [illegible] away [illegible] [illegible] all respect for the [illegible] of a conquering

force, and the suppression of the anti-foreign movement [illegible]. Had this been done we should have been spared [illegible] [illegible] and the large outpouring of blood and treasure. But the [illegible]

tional inertia of diplomatic conservatism that had existed since 1861 was too much for them [illegible], and they vacillated until almost [illegible] the [illegible] the last [illegible] the reactionaries carried the day, fortunately, however, to their [illegible] when the might of the outraged [illegible] was thrown against them.

As the Powers have only [illegible] the real [illegible] of the issues involved, this last outcome of 40 years of [illegible] attempt to [illegible] never be repeated. The elaborate superstructure of government [illegible] process which [illegible] its [illegible] has fallen like a house of cards, and cannot be set up again unless the Powers deliberately wish to undo the great work now under way. Whatever may be the final geographic adjustment, open or veiled, there must and will be an end of the [illegible] of the past. To be effective the readjustment of the foreign relations of China must be undertaken by [illegible] the actual economic and political superiority of the western

ary and [illegible] of China. [illegible] the imagination that [illegible] and [illegible] have known this better than the very [illegible] who under one pretext or another made [illegible] supposed [illegible] the foreign Powers through the studied [illegible] of the [illegible]. The long tutelage of the two boy Emperors, [illegible] and [illegible], whose reigns are coincident with China's diplomatic contact with the West, played into the hands of [illegible] it difficult for the Powers to save themselves from [illegible], which [illegible] as well as [illegible]. The peculiar relations that the [illegible] with, it must be remembered, were first established in 1861, and it was not until 1873, after [illegible] had been struggling for years with the newly organized Tsungli-Yamen, purposely [illegible] board and assigned to [illegible] outside the walls of the Imperial City, that they were granted an audience with Tungchih, then but 17 years old. At once the court [illegible] raised the preposterous question of kotowing, though they knew [illegible] European or American minister would submit to such degrading [illegible]. [illegible] was

perform the ceremony [illegible] modern times save the

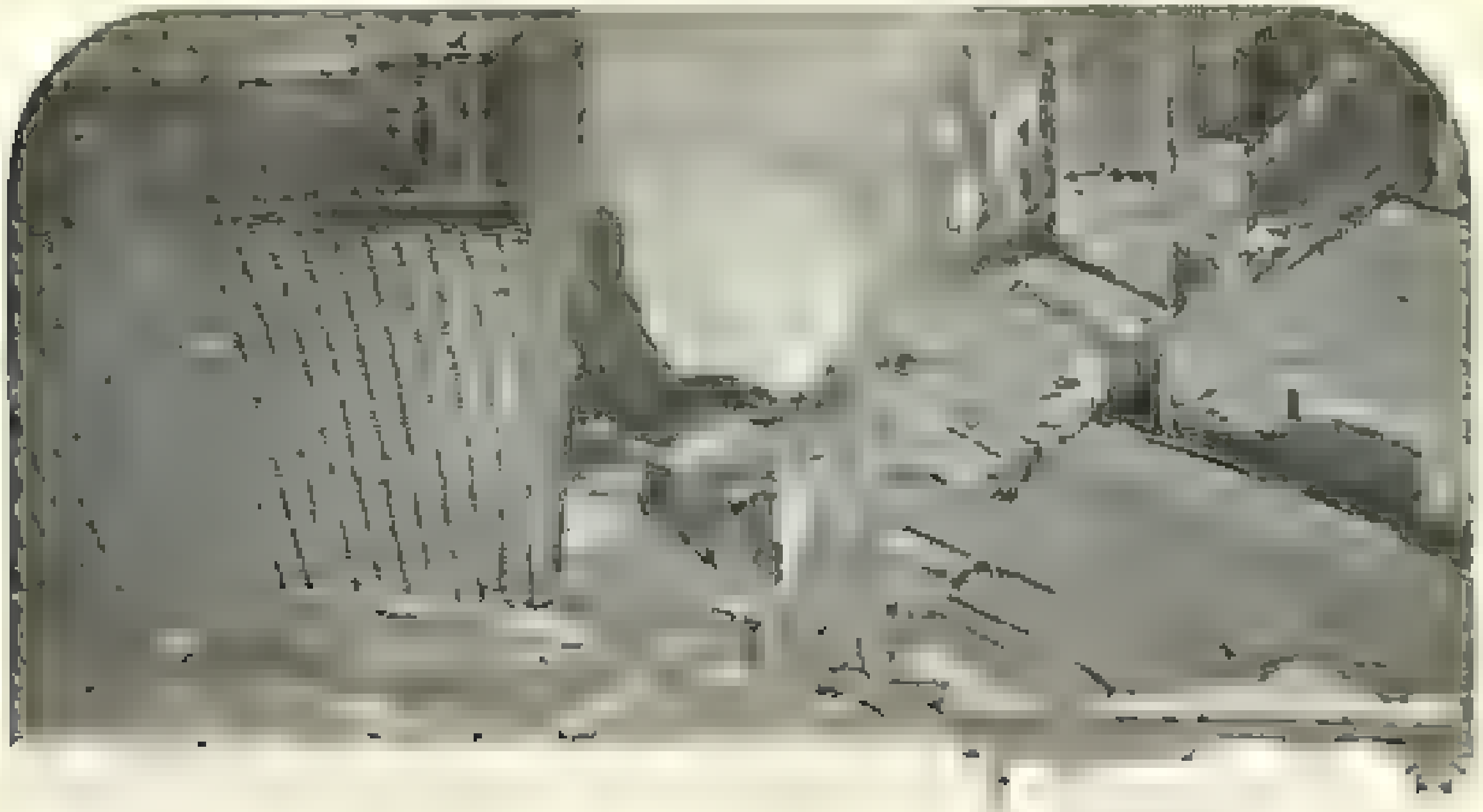
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



COLONIAL GOVERNMENT IN BORNEO

by JAMES M. [illegible]

It is now more than sixty years since there landed in Borneo a young missionary, not of the Gospel but of good government. When voyaging in the [illegible] Archipelago in 1839 he was deeply impressed with the fact that these islands of unequaled beauty and vast resources were peopled with savages, [illegible] war with each other and carrying on piracy on a vast scale. He determined to rescue some of these [illegible] people, from [illegible] to respect and appreciate the value of human life. And now, two years after, he had come there again, with a crew of twenty men, to carry out his [illegible] purpose. The [illegible] was apparently [illegible] in progress, [illegible] offered his aid to the Sultan, and as a reward for his services was made Rajah of Sarawak. His first task in establishing his power was to reform the methods of government, to prepare a code of laws, and to develop commerce as the most effectual means of putting down piracy. He endeavored to make his native subjects understand that the main object of his government was not the commercial exploitation of the country or the amassing of colossal revenues, but the preservation and well being of the people themselves, and that their ruler would be a terror only to evil doers, [illegible] of the general peace and the enemies of the commonwealth.

How has this strange experiment of placing men of a low type of civilization succeeded?* In attempting to answer this question I would [illegible] review the history of Sarawak since 1842 [illegible]

[illegible]

[illegible] district, which has only recently been ceded to Brooke by the Sultan of Brunei. In 1890 he was made Resident, a post which he now holds. The district is about 10,000 square miles in extent, with a population probably not far from 200,000, and the governing staff consists of the Resident and an assistant [illegible] the only white men in the district [illegible] and about 30 or 40 [illegible]

[illegible] independent. His power as executive [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] that their method of counting is as follows: [illegible] the names of [illegible] families [illegible] each house, and as [illegible] counts each name off on his toes; when five have been counted, another man [illegible] one end of the counted foot, and so on till his [illegible] and hands have all been told off, when another man is used and this continued till all the names are [illegible], when they [illegible] to see how many men have been used, and where the last [illegible]." This extraordinary willingness to pay tribute on the part of savages who had never before seen a white man is noticed by Professor Haddon, who says that they pay it "because then they can feel that they are citizens of the Raj, they realise the [illegible] government, and [illegible] by no means [illegible]. They know well that by paying two dollars a year they will have peace, be able to trade, and have all the advantages of a settled government, and they feel it is really a good investment for their money."

Before leaving, Mr Hose arranged for a similar peace-making between the Ibans and Madangs close to his official residence at [illegible]. This was [illegible], six thousand [illegible] being present. At one of the meetings a Madang chief "made a very eloquent and remarkable speech, in which he explained that his people had for years been compelled to fight on all sides [illegible] their own, but were now [illegible] able to appreciate the benefits of peace [illegible] the people of the Baram and surrounding districts—a result [illegible] which he [illegible] power [illegible]." The [illegible] outcome of this peace-making [illegible] proof of the [illegible]

and collected large quantities of jungle produce," and these very people, once [illegible] hostile to all, are now being used as a means to [illegible] friendly relations between our people and the border tribes. As Professor Haddon [illegible] the [illegible] natives, and native chiefs in the neighbouring Sultanate of Brunei have time after time asked Mr Hose to persuade the Rajah to take over their territory, and [illegible] living [illegible] how the people of Baram [illegible] peace and safety [illegible] put themselves under the [illegible] of Mr Hose. A few [illegible] he received a message from the principal chief of one of the [illegible] accompanied by a [illegible] the [illegible] of his people with the [illegible] of the Barams. The message he sent [illegible] was to the effect that his [illegible]

[illegible] one another. They had been divided and made enemies on account of mistakes and the foolishness of unimportant headmen, but he was anxious to meet the Baram people and glad to make peace. He is [illegible]

[illegible] the members of his party during their sojourn in the Batang Kayan.

The secret of this splendid and almost unexampled success in ruling a savage race is to be found in the fact that "the confidence of the natives has been won and retained by an unbroken record of promises fulfilled and benefits bestowed." Thus they have been educated into the belief that the single aim of their white rulers was their welfare. [illegible] ion," to use Mr Hose's words, "has always been on the side of the government and it is on the firm foundation of trust [illegible] that the whole framework" of Sir James Brooke's system of government rests. It must also be said that the personal influence of the Resident is also due in part to his [illegible]. He speaks six [illegible] of the Malay dialects—an important matter, for "you can never get at a [illegible] natives to his "wonderful energy and enthusiasm for the natives." [illegible] young natives come down on a visit to Mr Hose and stay with him for days or weeks at a time, and in this way the people learn what a white man, [illegible], is like and what a government really means. Thus Mr Hose's residence is a sort of university, whither the people come from all parts of the district to learn [illegible] the meaning of government.

Nor while attending to his official duties is he neglectful of other interests. He has prepared a valuable map of the Baram District which has just been published by the Royal Geographical Society. Dr Bowdler Sharpe speaks, on behalf of the British Museum, of the "extraordinary efforts to advance science that have characterised Mr Hose's residence in Borneo. He has made an enormous collection of mammals, birds, insects, shells, and every kind of animal. Not only has he given to the British Museum the first fruits of his work during his sixteen years' residence in Borneo, but there is not a museum in the whole world that has not received collections from this indefatigable young man [illegible]

[illegible]

great importance to the countries he has benefited." We may add

[illegible]

[illegible] Lake Nicaragua [illegible] Hayes, who published in the National Geographic Magazine for April, 1908.

In the Scientific American Supplement of [illegible] Professor Hull [illegible] Lake Nicaragua [illegible] Commission, that the level of the lake has declined 20 feet in [illegible] years. In arriving at this conclusion, Professor

[illegible]

[illegible] taken by the Commission. He gives a table [illegible] based on a report of the chief engineer of the Nicaragua Canal

[illegible] page [illegible] showing a rate of inflow to Lake Nicaragua [illegible] to the control of rain all at Rivas. This last [illegible] con-

[illegible] Presented as follows:

[illegible]

[illegible] of the Nicaragua canal [illegible] page 27, where it is shown that the flood areas are greater in quantity than is usual in other parts of the world, so that if less precipitation is provided for the side of conservation.

Professor Hedger's [illegible] opinion that [illegible] from Lake Nicaragua in the seven [illegible] years is [illegible] arranged

[illegible] no [illegible] whatever [illegible] to be [illegible] from the [illegible] made Professor Hedger [illegible] the natural [illegible] that the [illegible] 20 feet [illegible] when [illegible] [illegible] Too much [illegible] the [illegible] [illegible] the lake. As [illegible] conservative estimate the water required for the [illegible] of the canal is given on page [illegible] of the report, [illegible] [illegible] allowing [illegible] for leakage, [illegible] and power [illegible] [illegible] from the surface of Lake Nicaragua [illegible] of [illegible] to [illegible] years. When [illegible] [illegible] Lake Nicaragua [illegible] and Professor Hedger [illegible] figures [illegible] that [illegible] [illegible] 57 [illegible],

[illegible], which ought to be regarded as necessarily liberal.

As a matter of fact, no [illegible] would have to be discharged, either [illegible], or [illegible], from Lake Nicaragua prior to [illegible] for a period longer than the [illegible] period of [illegible] and always within the last generation of people [illegible] necessary to transfer [illegible] over the rapids during [illegible] season [illegible] to do this during the season of high water. This [illegible] based not only upon the testimony of [illegible] and as Mr. W. L. Merry for over [illegible] in charge of the transit company [illegible] Lake Nicaragua Mr. Merry to Nicaragua and Costa Rica [illegible] the existence of the eight steel steamers and lighters used for these purposes at that time which fully bear out the testimony that the region of the San Juan River, and therefore of Lake Nicaragua, has not materially changed with the exception of [illegible]

If the conclusions drawn by Professor Hubbard are correct, Lake Nicaragua has been [illegible] a short time at the present stage, but [illegible] a longer period it has not been a very marked and [illegible] to remove immediately [illegible] of [illegible] or clearly [illegible]

But the reasoning adopted by Professor Hubbard is [illegible] to the effect that [illegible] the subject of [illegible], and as a part of the [illegible] well as [illegible] and the [illegible] the water, which they have [illegible] to [illegible]

It is a [illegible] fact that, as [illegible] report shows that there is no probability of a recurrence of very wet years to make [illegible] from the Hydrographic [illegible] "So far as [illegible], there is no evidence whatever that [illegible] shall have ever been greater [illegible] than it is at the present time."[3] This [illegible] attempted at the [illegible] of an article [illegible] to show [illegible] that the water supply to Lake Nicaragua is a very great [illegible] of [illegible] and [illegible] that the [illegible] has been greater in the past than at the present time.

MRS BISHOP'S "THE YANGTZE VALLEY AND BEYOND"*

BY ELIZA RUHAMAH SCIDMORE

In these two volumes Mrs Bishop [illegible] of her travels in China during the years 1894 and 1897, [illegible] visits to Shanghai, Hangchau, and Ningpo, and [illegible] the regular tourist route up the Yangtze to the head of steamer navigation and the Gorges. Mrs Bishop pushed on beyond the scenic region to [illegible] in Szechuen province, and from that western [illegible] went on to the wild mountain region to the northwest of [illegible] the [illegible], people of [illegible], differing from [illegible] some forgotten Aryan [illegible]. At the farthest interior point [illegible] she [illegible] traversed [illegible] where no European had ever gone before, even the [illegible] having visited those villages.

It is a record of [illegible] hardships [illegible] encountered and [illegible]. The wonder grows, as one reads, that she should have [illegible] the provinces, [illegible] have followed her [illegible]. Her escape from [illegible] would seem [illegible] of fatigue and exposure, [illegible] of [illegible] conditions. [illegible] Mrs Bishop [illegible] the worst [illegible] of Chinese [illegible] the page [illegible] and it was [illegible] to take [illegible] the [illegible] from [illegible] food, [illegible]. After she [illegible] in wet clothes, [illegible] and [illegible], and once she [illegible] and [illegible] blew out [illegible]. The [illegible] water [illegible] [illegible] or [illegible] the route of Szechuen. Mrs Bishop [illegible] the [illegible] as she was [illegible] of the [illegible].

When she discovered that such open travel was [illegible] and [illegible] attracted [illegible] attention, [illegible] of street [illegible], Mrs Bishop [illegible] at the start, and [illegible] street [illegible] [illegible] ness, [illegible], brutal [illegible] and [illegible] quiet, kindly [illegible]

---

* *The Yangtze Valley and Beyond.* [illegible] Mrs Bishop, [illegible] of *Unbeaten Tracks in Japan*, *A Lady's Life in the Rocky Mountains*, *The Hawaiian Archipelago*, [illegible] illustrations from photographs by the author [illegible] New York [illegible]

traveler, but with the [illegible] cheerfulness, she did not turn back nor abate [illegible] any part of her contemplated tour. As she wore the Chinese [illegible] dress, with a [illegible] and European [illegible] under straw [illegible], she was [illegible] attracting attention and drew crowds of the curious, and Chinese men, not respecting her sex or her gray hair, pursued her savagely at times. "[illegible]" and "[illegible]" were the names [illegible] [illegible] chorus of "[illegible]" and [illegible] were yelled in many a [illegible]. Twice the mob pursued her into hiding places, pried open the [illegible] from the courts, and Mrs. Bishop had often to sit [illegible] dark and [illegible], revolver in hand, waiting for the last moment to come. Once a [illegible] and left her senseless, [illegible] she [illegible] felt the effects for many weeks. Chinese officials tried to discourage and prevent her visiting remoter sections, but she pressed on and on into the [illegible] and [illegible] every [illegible]. The true traveler's spirit seems to have possessed her, and one would hardly look for greater [illegible] in a [illegible] seeking [illegible] for the sake of spreading the faith, or in an explorer who [illegible] upon an unknown country, discovered a new river, or found [illegible] source of [illegible] riches. [illegible], [illegible], and many travelers have written of the Szechuen country and the borderland of Tibet, but Mrs. Bishop's narrative is to be classed as the most interesting one, and one repeats these praises of the scenery and [illegible] of that province.

[illegible] problems and [illegible] are woven in with the narrative, and [illegible] Mrs. Bishop was everywhere the guest of the missionaries, one has a very clear [illegible] of the mission work that is carried on so far into the interior [illegible] and encourage any but the truest, most earnest Christians. She speaks encouragingly of the progress and results of mission work, and her testimony is of the best and most appreciative that can be offered. Mrs. Bishop struggles earnestly to make out a good case for the Chinese, to praise them as a great and [illegible] people, but [illegible] of her experiences were [illegible] for [illegible] of praise, and her readers easily understand when she says: "China, with its crowds, its poverty, its risks of [illegible] from [illegible], [illegible] horrors, its filth, its venality, its [illegible], its grasping and [illegible] greed, and its political and religious conservatism, [illegible] like a nightmare." One [illegible] when she alludes to "a [illegible] about the people" — the repulsive people, whose lack of all kind of [illegible] is shown [illegible] in the daily life of travel.

After one trial of the experience at the hands of a mob, Mrs. Bishop [illegible] that "These rows are [illegible], nerve and [illegible] after [illegible] journey, and [illegible], which [illegible] was trying." Again, "The [illegible], brutal, coarse, insolent, conceited, cowardly roughs of the Chinese towns, [illegible] description, live in a state of filth which is [illegible], to an [illegible] of dirt, [illegible] which no existing words can describe. I wondered daily more at the goodness of people who [illegible] to the Chinese in the interior cities, not at their [illegible] the first time, but at their going back, knowing what they come to."

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

FOREST RESERVES OF THE UNITED STATES

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

THE GREAT WALL OF CHINA*

[illegible]

[illegible]

[illegible]

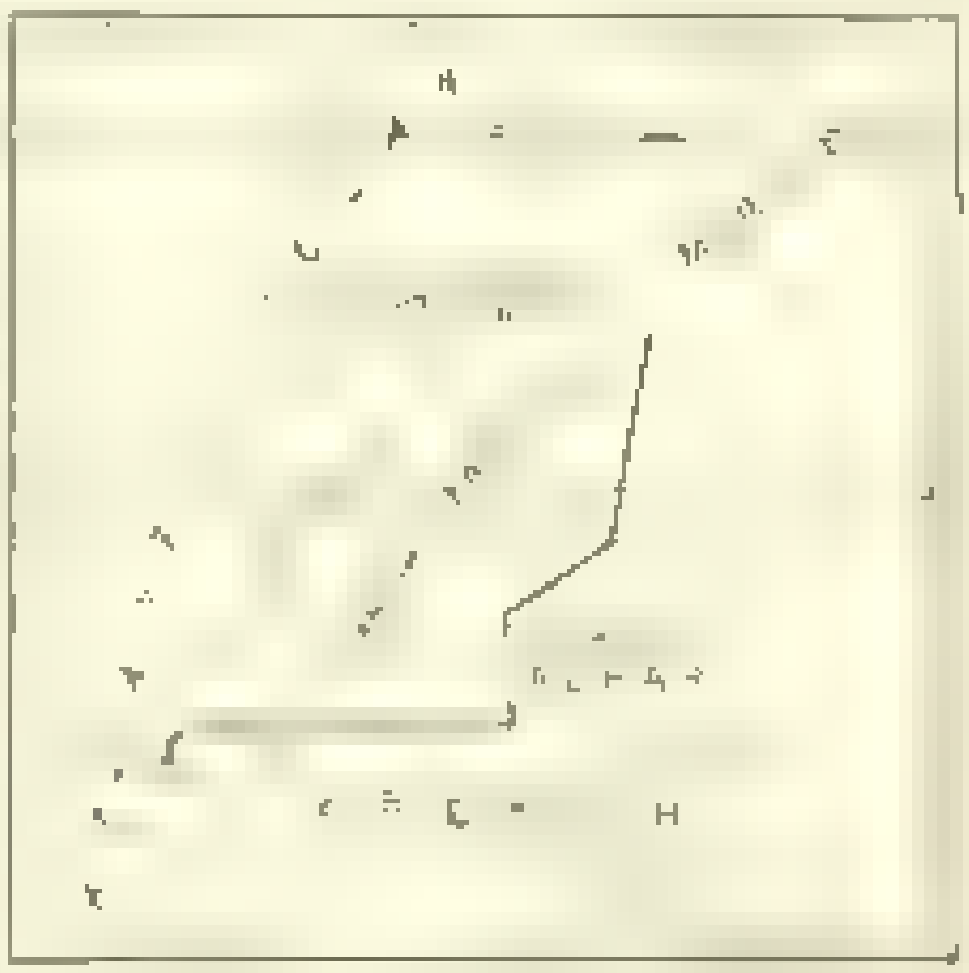
* [illegible]

[illegible]

GEOGRAPHIC NOTES

[illegible]

[illegible]



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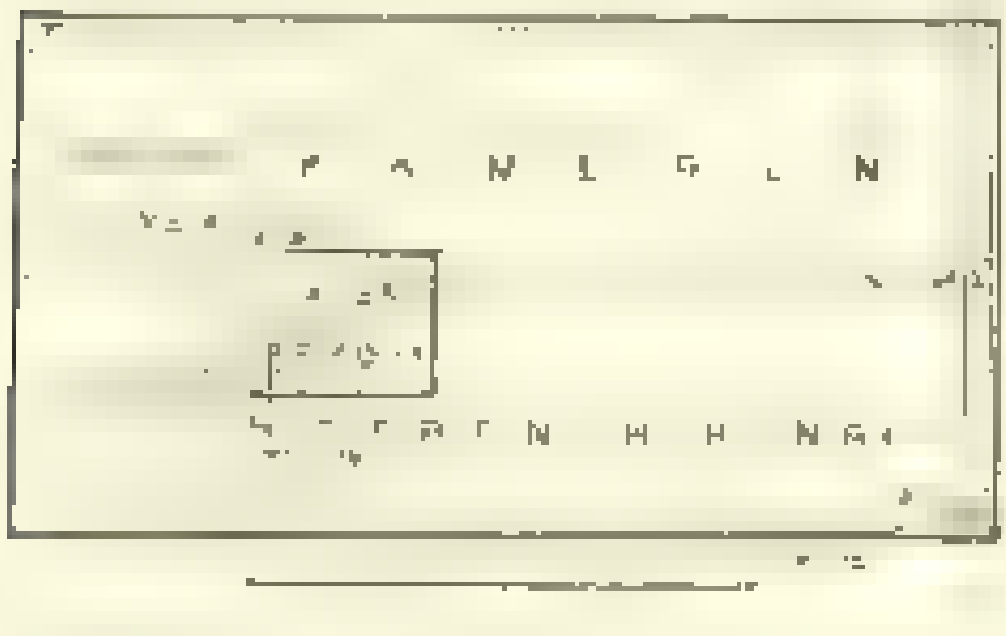
P A N E G L N

[illegible]

[illegible] of the United States [illegible] the world [illegible] South America [illegible] per cent [illegible]

[illegible] the foreign commerce of the United States for the year ending June 30, 1900, as summarized by Mr. O. P. Austin, are:

[illegible]

The exports [illegible] than those of any preceding year and were more widely [illegible] than ever before.

More factories and mills were [illegible] and formed a larger share of the [illegible] than ever before.

Manufactures [illegible] more freely exported and formed a much larger [illegible] exported [illegible] the United States [illegible]

[illegible] production of gold during the last [illegible] the first [illegible] for the fifty years ending [illegible] as against [illegible] for the preceding fifty years. [illegible] the United States [illegible] Alaska [illegible] The gold mined in the United States last year was valued at [illegible]

[illegible] of Massachusetts [illegible] New England.

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